



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

2044 106 440 035

LIBRARY OF THE GRAY HERBARIUM

HARVARD UNIVERSITY.

BOUGHT.

Ser
US
M 27

RECEIVED

FEB 21 1912

MUHLENBERGIA

An Illustrated Monthly Journal of Botany

Editors: A. A. HELLER and P. BEVERIDGE KENNEDY

Volume 7

Reno, Nevada

1911

CONTENTS

BLUMER, J. C.	
A new <i>Castilleja</i> from the Southern Rocky Mountains	44
Notes on Distribution of <i>Castilleja</i> on the Mexican Boundary	65
EASTWOOD, ALICE	
Hartweg's Explorations in California, I. II. III.	
IV.	20, 25, 37, 49
Explorations of William Lobb	100
FOSTER, A. S.	
<i>Cakile californica</i>	19
HALL, H. M.	
Additional Southern California Compositae	83
HELLER, A. A.	
The North American Lupines, III. IV. V.	1, 13, 85
The Coast Live Oak	16
The Gray' Pine	33
Seedlings of <i>Lupinus Tidestromii</i>	53
The Flora of the Ruby Mountains, I. II. III	104, 113, 125
New Combinations, V. VI.	123, 139
KENNEDY, P. BEVERIDGE	
An Ancient English Oak	71
Alpine Plants, I. II. III. IV. V.	95, 103, 111, 121, 133
Studies in <i>Trifolium</i> VI.	97
A new Species of <i>Phlox</i>	109
OSTERHOUT, GEORGE E.	
Two new Species from Colorado	11
<i>Senecio lanatifolius</i>	47
PARISH, S. B.	
Recent Literature—Cone-bearing Trees of the California Mountains; A Phytogeographic and Taxonomic Study of the Southern California Trees and Shrubs; A Flora of Western Middle California	55
Additions and Emendations	73
SMITH, C. P.	
The Fruit of <i>Lupinus Tidestromii</i>	51
Recent Literature—Spring Flora of the Wasatch Region	58
Notes from Northern Utah, III. IV.	61, 136

RECEIVED,
FEB 13 1911

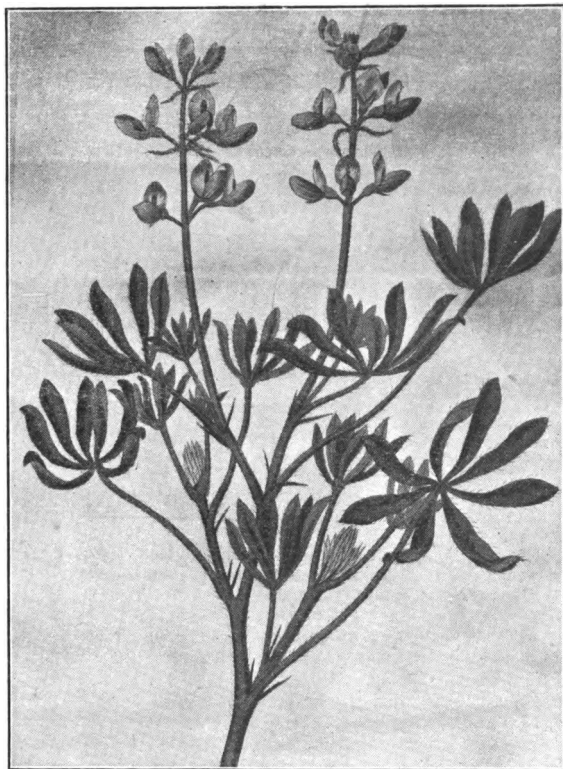
Volume 7

Number 1

MUHLENBERGIA

JANUARY, 1911

Editors: A. A. HELLER and P. BEVERIDGE KENNEDY



CONTENTS:

The North American Lupines—III: A. A. Heller	I
Two New Species from Colorado: George E. Osterhout	11

University of Nevada,
Reno, Nevada

MUHLENBERGIA

THE NORTH AMERICAN LUPINES—III

BY A. A. HELLER

A few days ago while referring to a letter written me by Dr. Greene, I discovered that one sentence had been carelessly read by me, and therefore I owe an apology to both Dr. Greene and Professor C. P. Smith. The passage is as follows:

"Lately I was well on the road to a description of a Californian annual species, which is here under the name of "*L. apricus*." I saw it was not at all that, and hunting further, I discovered that the thing had been published by you quite a while ago; your *L. persistens*" (*vallicola*).

Now, what I thought at the time, was that Dr. Greene considered *apricus* to be the same as my *vallicola*, and so informed Professor Smith. This should clear up the difficulty mentioned by him on page 135 of volume 6.

The latter part of May and a few days of early June, 1910, were spent by me in that wonderful country first made known botanically by Captain Meriwether Lewis, and a little later, but now nearly a century past, by that hardy explorer, David Douglas, who first discovered so many of our Pacific coast species. I refer to the Columbia river region. My main object was to study lupines at the places where Douglas collected his types, and this I was able to do in a satisfactory way, although it is necessary to spend several seasons there to cover all the ground. Among the species of which dependable material was obtained are *L. micranthus*, *bicolor*, *leucophyllus*, *plumosus*, *polyphyllus* and *sulphureus*. Two of these are treated in this paper, and the others will be mentioned later.

LUPINUS MICRANTHUS Dougl.; Lindl. Bot. Reg. **15**: *pl.* 1251.
1829.

"If this is not to be compared in point of beauty with such fine species as *L. perennis*, *ornatus* and others, which have been already figured in this work from Mr. Douglas's collection, it is nevertheless interesting as an addition to the number of species of annual Lupines.

"According to Mr. Douglas, this has much affinity with *Lupinus bicolor*, published at fol. 1109 of this work, from which it differs in being more slender, and in flowering from four to six weeks earlier. It is more particularly to be distinguished from that species by the shortness of its alae, its nearly sessile flowers, fleshy leaves, granulated roots, larger pods, and the colour and size of the seeds.

"Mr. Douglas found it abundantly upon the gravelly banks of the southern tributaries of the Columbia, and in barren ground in the interior of California.

"A hardy annual, flowering from May to July. Our drawing was made in the Garden of the Horticultural Society in 1828.

"Annual. Root fibrous, with warty, fleshy tubercles. Stem erect, branching, about a foot high, with short white downy hairs. Leaves digitate, with subulate, dark stipules. Leaflets 5-7, linear-spatulate, smooth above, ciliate with minute, short, fine hairs below, thick and fleshy, three-fourths of an inch long. Flowers partly whorled, few, sessile. Bracteae subulate pilose, darker than the leaves. Calyx silky, upper lip bifid, under entire. Vexillum ovate, blue, white in the centre, with two or four parallel black dots. Alae oblong, same length as the vexillum; keel falcate, acute: Legumen linear-oblong, with transverse furrows, 5 or 6-seeded. Seeds large, brownish gray, mottled.'—*Douglas. J. L.*"

The above is the original description of *L. micranthus*, except that the Latin description, immediately preceding the first paragraph quoted is omitted as unnecessary, the English one being a translation of it.

Plate 1



Lupinus micranthus Dougl Reproduced from the original plate

As early as 1835, Agardh reports "specimina Californica vidi in Hb. Lindleyi."

Watson, in Proc. Am. Acad. 8: 525. 1873, records it as occurring from Puget Sound to Southern California." His remark "near the last" (*nanus*), indicates that he had a very vague conception as to the identity of this species, notwithstanding the fact that he had access to the original description and illustration. He also indicates that he had seen a specimen collected by Douglas, but fails to state whether it was from the Columbia river region or from California, an important point, viewed in the light of our present knowledge.

Greene, Flora Franciscana, 38. 1891, says: "Common everywhere; but not at all agreeing with either the figure or description in the Botanical Register; and the type was from a very different and quite distant region of our western country, the upper Columbia River." He should have said lower Columbia river. While disagreeing with the Watsonian disposition of the species, he nevertheless adopted it, but significantly placed immediately after it his recently described *L. polycarpus*, with four species between it and *nanus*, an admirable and fitting arrangement, well graded steps in the matter of relationship.

Last May I collected on the Columbia river just below Hood River, Oregon, a plant which is undoubtedly true *micranthus*, my no. 10100 (figure 1). It is abundant in open grassy places, and was observed at several places along the railroad between Cascade Locks and Hood River. The leaves are somewhat succulent, and while the opening flower heads are rather compact at first, they soon present the lax appearance shown in the original illustration. Very few seeds were secured, but sufficient to show that they are "large, brownish gray, mottled." They are 3.5 mm. long, 3 mm. wide.

Having accepted the usual interpretation of *micranthus*, for my studies had not led me to carefully look into the status of this species, my surprise was great when I found nothing in the type region that agreed with my preconceived ideas, but instead a plant much resembling the western middle Californian *L. polycarpus*. That it was no chance immigrant was shown

by the fact that it was the only form found over a large extent of territory, ranging from the upper Willamette valley to the banks of the Columbia, and up that stream to the eastern flank of the Cascade mountains.



Figure 1. Floral parts of *Lupinus micranthus*, enlarged.

As Professor C. P. Smith has recently affirmed, his study based upon my Hood River specimens, the nearest relative of *micranthus* is *L. polycarpus* Greene, and Douglas' specimen from California cited by Agardh, if it really is from California, is in all probability *L. polycarpus*. Douglas had not yet collected in California when *L. micranthus* was published, having penetrated southward only as far as the headwaters of the Willamette. The latter part of the sentence describing its habitat "in barren ground in the interior of California," seems best applicable to eastern Oregon or Washington, but it may refer to the upper Willamette region. Were the date of collection or observation given, the place could easily be fixed. If *micranthus* is found at all in California, it will no doubt be as an introduction and not as a native.

The flowers are described as sessile, though Lindley in his explanatory remarks says "nearly sessile," and this is correct, for they have quite short pedicels, 2 mm. or less. They turn pale in drying, as do also the flowers of *polycarpus*. The lower calyx

lobe is not entire as described, but broad and shortly 3-toothed when spread out.

When the Californian plants now referred to *micranthus* are carefully studied, they will be found to consist of a mixture of several species, and none of them closely related to true *micranthus* unless perhaps *L. umbellatus*, which I suspect is often labeled *micranthus* in southern California.

LUPINUS BICOLOR Lindl. Bot. Reg. 13: pl. 1109. 1827.

(With cover illustration)

As recently pointed out by Professor C. P. Smith in this journal (6: 136), the plants which in California have commonly been called *L. bicolor* are not that species at all. He, however, was not the first to call attention to the matter, for in *Flora Franciscana* 39, Greene notes: "Sandy soil about San Francisco, in a slender depressed very hairy form; also on gravelly crests of the Oakland Hills, where it is stouter, with ascending branches. The two may well be distinct species; and neither plant agrees perfectly with the original *L. bicolor* of the Columbia River." The plant from the Oakland hills was no doubt Greene's *L. apricus*.

Under the original description, the habitat of this species is given as "in the interior of the country about the Columbia River, from Fort Vancouver to the branches of Lewis and Clark's River, always on dry gravelly soil under the shade of trees in the open plains."

Fort Vancouver was located in what is now known as Mill Plain, a short distance from the present thriving town of Vancouver, Wash. Our own government now maintains an important army post at Vancouver, but the Fort Vancouver of Douglas' time was maintained by an English fur company.

Last May it was my privilege to visit Vancouver, and the first plant collected after proceeding up the river past the inclosure of the military reservation was *Lupinus bicolor*, growing on an open grassy slope within the town limits, or at least inside the built-up portion. But there were no trees there to shade it, although they may have been there in former times. From the

first glimpse of the plant there was no doubt concerning its identity. The few flowered whorls and the wide spacing between the apices of banner and wing, so well shown in the original plate, at once settled the matter.

Lindley describes the calyx as without bractlets between the lobes, but upon close examination they are found to be present. The lower lobe is said to be entire, but is slightly 3-toothed. Unless the lobes are flattened out, minute toothings is apt to be overlooked, even in living specimens. The seeds are just as described, "clouded with greenish-brown [areas of minute dots], having on each side a dark oblique line." They are 3.5 mm. long, 3 mm. wide.

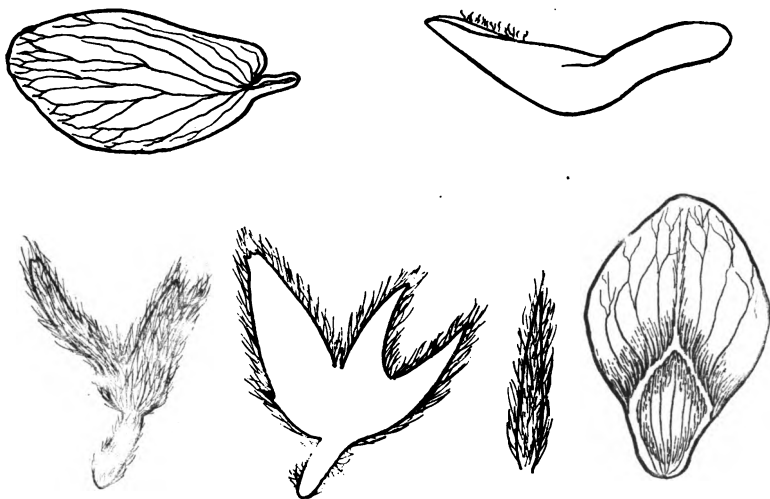


Figure 2. Floral parts of *Lupinus bicolor*, enlarged.

Piper, at the time his flora was published, had seen no specimens of this species from Washington. Besides my 10069 from Vancouver, from which the accompanying illustration of the floral parts is taken, I have several specimens collected by John Macoun in the vicinity of Victoria, British Columbia. Two of these have pink flowers. So far I have seen nothing from south of the Columbia river that can be referred to *bicolor*.

The cover illustration was copied from the original plate at Stanford University through the kindness of Professor Abrams.

Plate 2



Lupinus bicolor Lindl Reproduced from the original plate

This, together with the figure of the floral parts here presented, should enable any one to determine whether he has *L. bicolor*.

Lupinus sabulosus

Annual: stems several, widely spreading, the lowermost prostrate, finally 2 dm. long, the ascending or erect ones 1 dm. long, silky pilose, as is the whole plant, leafy: petioles slender, 4 cm. long or less; leaflets 5 to 8, commonly 6, 12 mm. long, 2 to 3 mm. wide; stipules subulate, 5 mm. long: peduncles up to 6 cm. long, rather stout: inflorescence short, even in fruit not exceeding 3 cm.: flowers in 1 to 2 whorls: bracts linear-lanceolate, early deciduous, 4 mm. long: calyx lobes nearly equal, the upper 4 mm. long, deeply parted, the acute segments with a



Figure 3. Floral parts of *Lupinus sabulosus*, enlarged.

broad sinus between, their apices slightly incurved, 4 mm. wide at the apex when spread out, a little narrower at base; lower lobe 5 mm. long, with 3 short teeth, 4 mm. broad at base, 1 mm. at apex when spread out, strongly convex and appearing as if entire when fresh: corollas 7 mm. long and as deep, space between apices of banner and wings 5 mm.; deep violet-blue except the face of the banner, which is white changing to red-purple, with several dark blotches along the groove, the sides turned

back and parallel above, flaring below; wings strongly inflated, open and exposing the keel for nearly its whole length; keel but moderately curved, ciliate toward the purple apex: mature pods 25 mm. long, 5 mm. wide, 8-seeded: seeds 2.5 mm. long, 2 mm. wide, pale, marbled and mottled with deep brown.

The type, in the herbarium of A. A. Heller, is *Heller 6627*, collected April 25, 1903, on sand hills near the Marine Hospital, San Francisco, California, distributed as *Lupinus micranthus*.

In 1907 I again collected this species in sand near Ocean View, San Mateo county, and distributed it as *L. bicolor*, suggesting in *Muhlenbergia* 2: 292, that San Francisco "may really be the type locality," basing my opinion on Piper's remark (Cont. U. S. Nat. Herb. 11: 353) that "the species seems to be common in California, and extends into Oregon, but no specimens from Washington have been seen." But this theory of mine would have to be abandoned, even without having re-collected *bicolor* at Vancouver, Washington, the type locality, for, Douglas did not visit San Francisco until four years after it was published.



Figure 4. *Lupinus sabulosus*, flower and calyx, natural shape

Between 1903 and 1907 I had studied the description and plate of *L. bicolor*, and came to the conclusion as did Professor Smith, recently expressed in this journal (6: 137), that the sand loving plant of the San Francisco peninsula is identical with *L. bicolor*. I still held that view until a few days ago, and had included it under my notes on *bicolor* for this paper. But a careful study of the dissected floral parts of the two shows them to

be distinct. The differences are well shown in the accompanying illustrations of the two species.

The seeds of *L. sabulosus* are considerably smaller, darker, the mottling of a rich brown, and exhibit no trace of the dark oblique line so prominent on those of *L. bicolor*.

TWO NEW SPECIES FROM COLORADO

BY GEORGE E. OSTERHOUT

***Schmaltzia pubescens* sp. nov.**

A low shrub about 1 m. high, the branches of the year, the petioles, and the leaves, whitish with a dense pubescence, the branches remaining so for a year or two: the leaflets of the trifoliate leaf sessile on the petiole, the terminal leaflet largest, averaging about 2 cm. long, cuneate at base, slightly three lobed at the end, the middle lobe with three rounded teeth, the lateral ones with two, the lower leaflets broadly cuneate at base or rounded, 1 to 1.5 cm. long, some of them lightly lobed, some crenate at the end, slightly darker on the upper surface: flowers and fruit in a dense glomerule, the berries deep red, 5 to 6 mm. in diameter, thickly pubescent with comparatively long hairs.

The type specimens were obtained near Rule creek, Bent county, Colorado, June 9, 1910, no. 4306. This *Schmaltzia* seems to be nearest related to *S. Emoryi* Greene, but the thick pubescence is whitish and not so long as in *S. Emoryi*, and it seems to be a smaller shrub. It differs from all other Colorado species of *Schmaltzia* which I have seen in its dense pubescence.

The species of *Schmaltzia* in Colorado differ much from each other. One on the plains near New Windsor has a small leaf, slightly pubescent on the lower surface, and light green; its berries are deep red, slightly pubescent with short hairs. This I take to be *S. trilobata* (Nutt.) Greene. The shrub growing in the foothills has a much larger leaf, darker in color, very slightly pubescent, its fruit lighter in color, nearly glabrous. I take this to be *S. Bakeri* Greene. Dr. Greene's *S. cognata*, described from Baker, Earle and Tracy's no. 525, collected at Durango, seems to be the same as Baker's no. 406, collected at Cimarron, and does not differ greatly from *S. Bakeri*. There is

a species of western Colorado which may be *S. quercifolia* Greene. Dr. Greene has also described two other species from Colorado, *S. subpinnata* from the canyon of the Arkansas at Canon City, and *S. oxyacanthoides* from Grand Junction. These two I have not seen. However, there are several species of *Schmaltzia* in Colorado, and not one, as some botanists have supposed.

***Carduus vernalis* sp. nov.**

Perennial from a deep root, 2 to 4 dm. or more high, strict and having one or two heads on the smaller plants, or branched and having numerous heads on the large: stems with some tomentum at the time of flowering: leaves all narrowly linear, white tomentose beneath, green with slight tomentum above, the lower about 1 dm. long, scarcely 1 cm. wide, rather distantly toothed, the narrow triangular teeth pointed by weak spines, the upper leaves successively smaller and continuing to the heads, sessile by a clasping base, scarcely at all decurrent on the stems: heads 1.5 to 2 cm. wide and the same in height to the end of the bracts; these in about 8 series in successive lengths, 6 of the series short and fimbriate tipped, the 2 upper series lengthened and ending in scarious, usually twisted tips: flowers bright red-purple: seeds dark brown, small, 5 mm. long, 2 mm. wide.

The type specimens were collected at De Beque, Mesa county, Colorado, May 26, 1910, no 4225. Professor Elsworth Bethel also collected it at the same place in 1909. It is quite common on the hills north of De Beque, and I think extends northward to Routt county.

The color of the flowers and the fimbriate tips of the bracts would place this species with *C. perplexans* Rydb., but the leaves are much narrower and there are more series of bracts. While this species and *C. perplexans* have fimbriate tipped bracts, suggesting relationship with *C. americanus* (Gray) Greene I do not regard them as closely related to it. They are both from the western slope and do not grow at high elevations. *C. americanus* seems to belong to timbered sections, and these to the open country.

New Windsor, Colorado.

AMERICAN FERN JOURNAL

Official Organ of the
AMERICAN FERN SOCIETY

Published quarterly. \$1.00 a year, including membership in the American Fern Society. Single copies 25 cents. No. 1, August, 1910, and No. 2, December, 1910, with membership and subscription for 1911, \$1.40.

Subscriptions should be sent to H. G. RUGG, HANOVER, N. H.

Matter for publication should be addressed to PHILIP DOWELL, PORT RICHMOND, N. Y.

MUHLENBERGIA

A monthly journal devoted to systematic botany of the higher plants in its broadest sense. Articles on cryptogams (ferns excepted) are not accepted for publication.

The subscription price is \$1.00 a year to all parts of the United States including its foreign possessions, to Cuba, and to Mexico. To all other countries, including Canada, the subscription price is \$1.25 a year. Subscriptions begin with the January number, for full volumes only. Subscribers who wish to discontinue should send in notice promptly at the end of the year. All numbers of a new volume sent to subscribers who fail to give such notice must either be paid for or returned in good condition.

Articles for publication or other communications concerning the journal may be addressed to either of the editors at the University of Nevada, Reno, Nevada.

Subscriptions should be made payable to A. A. Heller, 539 West 5th street, Reno, Nevada.

Volume 1, 1900-1906, consisting of 154 pages, contains 20 titles, with descriptions of many new species and interesting notes about old ones. This volume is of special interest to western botanists. Price \$1.00.

Volume 2, not yet completed. The 340 pages issued deal with the explorations of A. A. Heller in California during 1905, 1906, and 1907. The completed volume will contain about 425 pages. Price \$4.00.

Volumes 3, 4, 5 and 6 (current), issued as a monthly Price \$1.00 each.

Entered as second-class matter November 24, 1908, at the post office at Reno, Nevada, under the Act of Congress of March 3, 1879.

ANNOUNCEMENT

A new edition of the Catalog of North American Plants is in preparation. Thus far 116 pages have been printed, and other parts will follow as fast as possible. In all there will be about 300 pages. Since a considerable time must elapse before the work can be completed, the 116 pages and other parts as soon as issued, will be sent to those who wish to have them in that form, for \$1.25, payment to be sent with the order.

When completed the Catalog may be had in neat green cloth binding for \$1.50 postpaid. Orders for the cloth bound book may be sent in now, payment to be sent when the book is delivered.

A. A. Heller,
539 West 5th street, Reno, Nevada

RECEIVED
MAR 20 1911

Volume 7

Number 2

MUHLENBERGIA

FEBRUARY, 1911

Editors: A. A. HELLER and P. BEVERIDGE KENNEDY



Quercus agrifolia Nee

CONTENTS:

The North American Lupines—IV: A. A. Heller	13
The Coast Live Oak: A. A. Heller	16
Cakile californica: A. S. Foster	19
Hartweg's Explorations in California—I: Alice Eastwood	20

University of Nevada,
Reno, Nevada

2. 2. 2. 2. 2.

2. 2. 2. 2. 2.

2. 2. 2. 2. 2.

2. 2. 2. 2. 2.

2. 2. 2. 2. 2.

2. 2. 2. 2. 2.

2. 2. 2. 2. 2.

2. 2. 2. 2. 2.

MUHLENBERGIA

THE NORTH AMERICAN LUPINES—IV

BY A. A. HELLER

LUPINUS CUSICKII Wats. Proc. Am. Acad. **22**: 469. 1887.*Lupinus brachypodus* Piper, Bull. Torr. Club **29**: 642.
1902.

Through the kindness of Mr. Cusick I have been able to see co-types of both these species. Although the specimen of *brachypodus* is much smaller than that of *Cusickii*, a suspicious resemblance in leaf shape and in pubescence led me to carefully compare the flowers, with the result that the two were found to be identical.

Of the two descriptions, Piper's is by far the better. The two types differ principally in size, *Cusickii* being a denser, more branched plant, while the inflorescence of *brachypodus* is somewhat more elongated, one plant having it extended beyond the leaves. I have not yet had a chance to study typical *L. aridus*, and there is a possibility that both may be synonyms of that species, though the original illustration would not so indicate.

Lupinus Agardhianus*Lupinus gracilis* Agardh, Syn. 15. *pl.* 1. *f.* 2. 1835. Not*L. gracilis* Nutt. Journ. Phila. Acad. **7**: 115. 1834.

The penciled date on the cover of my separate of Nuttall's article led me to believe that his *L. gracilis* has priority over the same name by Agardh, but in order to make no mistake I wrote to Dr. J. H. Barnhart, Librarian of the New York Botanical Garden, who kindly looked the matter up and wrote as follows:

"The part of Jour. Acad. Phila. containing Nuttall's paper (7: 61-115), which was vol. 7, part 1, was published in October, 1834. Agardh's Synopsis Generis Lupini was first published in the form of three theses, dated 14 December, 1835; the common form being a reissue without the thesis title-pages but also dated 1835. Nuttall's name therefore has about fourteen months priority over Agardh's."

Therefore, Watson's *L. Nuttallii*, substituted in Proc. Am. Acad. 8: 526. 1873, for *L. gracilis* Nutt. must be displaced and Nuttall's name restored. Why Watson made the change, I do not know, except that Agardh's name was published in a monograph, and hence supposed to have a better right to be used than Nuttall's, though lacking priority.

Lupinus apodotropis

Perennial, height unknown, but probably not less than 6 or 7 dm.: lower part of stem unknown, fragment of upper portion 3.5 dm. long including the inflorescence deeply channeled, somewhat appressed pubescent with clear white hairs: petioles of basal leaves nearly 6 dm. long, pubescent and grooved like the stems; leaflets about 8, elliptical-lanceolate, 10 cm. long, 2 cm. wide, the apex acute and spinulose tipped, deep yellow green and glabrous above, somewhat appressed pubescent and paler beneath; stem leaves scattered, on successively shorter petioles, the uppermost sometimes almost sessile, their leaflets 5 cm. long, 12 mm. wide: peduncles short, 5 cm. or less: inflorescence 1.5 dm. long, flowers in close whorls, violet-blue, 12 mm. long, 10 mm. deep, space between apices of banner and wings 4 mm.: bracts 11 mm. long, densely pubescent with long white hairs: pedicels purplish or brown, 6 mm. long, pubescent like the bracts: calyx densely villous, its lobes lanceolate, the upper broadly so, 5 mm. long, 3 mm. wide at base, 2-toothed, the sinus V-shaped; lower lobe 6 mm. long, 2 mm. wide at base, entire, rather narrow and convex; bractlet between the lobes 1.5 mm. long, long-villous: banner with the sides turned back and parallel, apparently almost meeting, the upper part of the face rather narrow with a deep but narrow groove, the lower part strongly concave, form-

ing a rounded sac at base but not spurred, the whole orbicular-ovate when spread out, 1 cm. broad; wings moderately inflated, about 5 mm. across, depressed and grooved on either side above, the lower edges gradually rounded to the apex, inclosing the keel; keel glabrous, strongly curved, the purple apex slender, the base not narrowed into a stipe: pods (immature?) 2 cm. long, 6 mm. wide, densely white villous but the pods themselves dark, the whole appearing gray, 5-seeded; seeds oblong-ovoid, 4 mm. long, 3 mm. wide, dotted and mottled with brown, some spots minute, others fairly large, all irregular.



Figure 5. Floral parts of *Lupinus apodotropis*, enlarged.

The type, in the herbarium of the Nevada Agricultural Experiment Station, is *Cusick 3359a*, collected August 5, 1909, in the Wallowa mountains, on the banks of West Eagle creek, Baker county, Oregon, altitude 5200 feet. Mr. Cusick writes that it is very abundant in the Wallowa and Blue mountains of Oregon at altitudes of 5000 to 7000 feet, growing in dense, large masses on stream banks.

While averse to describing fragmentary material, the type consisting of two flowering tops, a fruiting spike and a basal leaf, I have been unable to obtain better material. This species has been referred to *L. polyphyllus*, but differs considerably. It has smaller flowers, much larger bracts, longer and acuter calyx lobes of quite different shape, a narrower flower, the banner with a deeper sac at base, and above all, in the stipeless keel, an unusual feature. Of the known species, it is probably related to *L. Burkei*.

THE COAST LIVE OAK

BY A. A. HELLER

QUERCUS AGRIFOLIA Nee, *Anales de Ciencias Naturales* 3: 271.
1801.

This beautiful evergreen oak, characteristic of the coast hills and valleys in the bay region of California, was first collected at Monterey in September, 1791, by Thaddeus Haenke, one of the botanists of the Malaspina expedition, planned by Charles III. of Spain, and sent out by his successor, Charles IV. on a voyage of discovery and scientific exploration of the distant possessions of the Spanish kingdom.

Haenke was not only the first botanist to visit California, but *Quercus agrifolia* was the first Californian tree described and published by a botanist. But it had been previously mentioned in what might be termed a "popular" way by several persons. The earliest of these was Father Venegaz, in his *Natural and Civil History of California* 1: 46. 1758. He referred to it as "holm," a word denoting an evergreen tree with prickly foliage.

Vancouver, who visited California in 1792, noted on or near the site of San Francisco, "small bushy holly-leaved oaks," and in the valley about the Mission of Santa Clara "the holly-leaved oaks were increased from dwarf shrubs to trees of considerable size." While at Santa Barbara in the fall of 1793 he "procured some stout knees from the holly-leaved oak, for the security of the Discovery's head and bumkins." His journal, containing these extracts, was published in 1798.

The accompanying illustration was taken in the type region on the Carmel valley slope of the road leading from Monterey to Carmel Mission, and shows the characteristic growth of a mature tree grown in the open. The following is taken from Sudworth's *Forest Trees of the Pacific Slope*:

"It has a short, clear trunk and a narrow or very broad, dome-shaped, dense crown, according to whether it is crowded or in the open. It usually grows in the open. Occasionally it is only a low, shrubby tree. It is ordinarily from 25 to 50 feet

in height and from 1 to 2 feet in diameter. Very old trees in the open are from 60 to 75 feet high and from 3 to 3½ feet through. Very long, thick, crooked limbs are given off from the short, clear trunk (which is often only from 4 to 8 feet long), forming with numerous fine twigs a dense, exceedingly broad crown, sometimes reaching the ground; trees in crowded stands have rather slender branches. Small trees and the large limbs of big trees have smooth, light grayish-brown bark, with frequent ashy-white areas, while large trees have very thick, hard, blackish or very dark brown, roughly furrowed bark, with wide ridges. Season's twigs, dull gray to reddish brown, with pale chestnut-colored buds, are somewhat downy, with very short, whitish hairs.



Figure 6. *Quercus agrifolia* Nee

“Mature leaves are more or less conspicuously curled on their prickly-toothed or entire edges and are usually dark (but often light) shiny green on their convex upper sides—sometimes coated with light colored minute, star-shaped hairs, while beneath they are paler green, smooth, somewhat shiny, and with brownish hairs in the angles of the veins, or, again, the entire under surface is downy with minute, dense hairs. The leaves are thinnish, but peculiarly stiff and brittle. The foliage ap-

pears to be evergreen, but remains on the trees only until the succeeding spring, usually beginning to fall before or a short time after the new leaves are formed. Flowers appear mainly in early spring, the acorns maturing in the autumn of that season; occasional trees produce flowers in the fall and small immature acorns which drop from the trees by spring. The cups of acorns are peculiar in having their scaly edges turned in. Wood brittle, hard, heavy, exceedingly fine-grained, reddish brown; sapwood very thick and darker than heart. It has economic value only for fuel, since the tree has a very poor timber form and the wood checks and warps badly in seasoning. Bark of this species is extensively used to adulterate the similar but much more valuable tanbark obtained from the California tanbark oak."

It ranges from Mendocino county south to northern Lower California in the coast region, occurring on "low hills and open valleys, slopes of higher foothills, shallow canyons, in dry loamy or gravelly soils; also (but stunted) on exposed seashore." While not positive, I think it is found on the summit of Mt. Hamilton, Santa Clara county, at an altitude of 4200 feet. Sudworth records it from such an altitude only in the extreme southern part of its range. It is also found on all of the islands off the coast of southern California. Roughly, it occurs mainly within the fog belt, but Sudworth says the climatic conditions are similar to those for Monterey pine. This is not altogether correct. The Monterey pine is subject to almost daily fogs in summer, which is not the case in much of the range of this oak. The average annual precipitation for the pine is given as seventeen inches. In Mendocino county it is probably forty inches, but the oak is not common there. At Los Gatos, Santa Clara county, where it is common, the average rainfall is thirty-one inches, and a few miles farther back in the mountains is not less than forty inches.

One might infer from the sentence describing the falling of the old leaves that they drop rapidly as do those of the ordinary deciduous trees. This is not the case, for at no time does the

tree show any apparent diminution of the mature foliage, being perpetually clothed with a dense glossy coat of green, with the added bright tints of the unfolding leaves in spring.

CAKILE CALIFORNICA

The genus *Cakile* seems to be a southern one, and this species strictly maritime. From the description it appears to be near *C. maritima* Chapman, and indeed may be synonymous. *C. californica* has been collected on the northwest coast at the following stations:

Near Port Angeles, Wash., by Webster, 1908, *fide* J. B. Flett; near Pacific Beach, Wash., 1908, 1910, by A. S. Foster; near Long Beach, Wash., 1907, by students of Stanford University, *fide* Muhlenbergia; near Tillamook Head, Oregon, *fide* M. W. Gorman. These stations are probably about the northern limit of distribution. The writer will mail a specimen to the first applicant.—A. S. FOSTER, *Pacific Beach, Wash.*

HARTWEG'S EXPLORATIONS IN CALIFORNIA—I

BY ALICE EASTWOOD

While looking up types of Californian plants at the Gray Herbarium, I became aware of the great number of specimens collected by Hartweg contained therein. About the same time I happened upon a reference that led me to Hartweg's Journal, published in the Journal of the Horticultural Society, 1846-48. The earlier part of this refers to travels in Mexico, and is of little interest to Californian botanists; but the part that narrates his travels and collections in California are not only interesting, but also give us knowledge of where he collected and the approximate localities where his types were obtained. While I had the opportunity I sought in the Gray Herbarium all the specimens numbered, described and named in Bentham's *Plantae Hartwegianae*, so as to see whether later botanists had made any changes. The following reprint of the Journal and list may be of value, since so far as in my power it gives the results of latest determinations.

I have been able to learn very little about Theodor Hartweg. He was a German botanist sent first to Mexico in 1836 by the Horticultural Society, and later in 1846 and 1847 visiting and collecting in California. The beginning of the part of his narrative which concerns us is found on page 122 of volume 2 of the Journal of the Horticultural Society, received November 4, 1846:

"On the 14th of March, I finally left Tepic for San Blas, whither my luggage had preceded me, and embarked the following day on board of a small schooner for Mazatlan where I arrived after a passage of five days. Mazatlan is now the most important port on the west coast of Mexico, as the customhouse officers are more accommodating than at San Blas or Acapulco.

Upon making inquiries about merchant vessels proceeding soon to Northern California, I found to my consternation that no opportunity had offered for the last six months, nor was it likely there would be any for some time; but that the United States ship 'Portsmouth' would sail in a few days for Monterey.

The day previous to her sailing I applied to Commodore Stoot for a passage backed by a letter of introduction from an influential house in Mazatlan, but I was told by him in a very few words that he could not serve me; that under the present circumstances, when a rupture between the United States and Mexico was hourly expected, he could not let his movements be known; thus wishing to keep the 'Portsmouth's' destination secret—her purpose being well known three weeks before she sailed.

"More successful was an application I made about the beginning of May to Rear-Admiral Sir George Seymour of H. M. S. 'Collingwood,' who kindly allowed me a passage on H. M. S. 'Juno' then proceeding to Monterey. Towards evening of the 11th of May, I went on board, and, sailing the following morning, we arrived at Monterey on Sunday the 7th of June, after a passage of twenty-six days.

"On the 8th I delivered my letters of introduction, and the following morning I settled down in the quiet little town of Monterey.

"The verdant fields and pine-covered range of mountains at the back of the town form a pleasing contrast to the dried-up vegetation about Mazatlan. The predominating tree is an evergreen oak (*Quercus Californica* (1)), forming a tree 30 feet high, with a globular crown, and having the branches much distorted. It occurs principally in low but dry situations. The higher parts are occupied by *Pinus insignis*, a tree 60 to 100 feet high, with a stem 2 to 4 feet in diameter. This species is liable to vary much in the size of the leaves (which stand in threes) and in the cones (according to local circumstances). In close woods a mile or two from the sea-shore, at an elevation of 200 to 300 feet, the leaves usually measure $4\frac{1}{2}$ to $5\frac{1}{2}$ inches, and cones 4 to $4\frac{1}{2}$ inches in length by $2\frac{1}{2}$ broad; toward the beach where the trees are mostly one-sided—a defect caused by north-west winds, which blow for the greater part of the year—both leaves and cones diminish in size.

(1) *QUERCUS AGRIFOLIA*.

"These differences, which are too insignificant to establish even varieties of *Pinus insignis*, have given rise to the names *Pinus tuberculata* and *radiata*, which were according to Loudon, collected by the late Dr. Coulter near the sea-shore at Monterey; that locality, no doubt, is Point Pinos, as it is the only habitat near Monterey where pines grow close to the beach; it is at the same time the place where I made the foregoing observations. In all situations the cones grow three or four together in a cluster, remaining on the trees several years after shedding the seeds; are pendulous, with the apex somewhat recurved; deformed, that is, the scales on one side are more developed than on the other, and enclose two winged seeds under each scale. The cones are about eighteen to twenty-four months in ripening.

"On the dry banks of ravines to the north east of the town, the Californian horse-chestnut (*Pavia Californica*) is common. This extremely ornamental shrub or low tree rises to the height of 25 feet, is of a globular shape, and produces its fragrant white flowers of a delicate pink hue in great abundance on spikes 12 inches long; one of these spikes, which I had the curiosity to count, had more than 400 open flowers and buds upon it. Of shrubs I observed *Ceanothus thyrsiflorus* very common in the pine woods, and forming an evergreen shrub 10 to 15 feet high; *Sambucus* No. 28 (1); *Lonicera racemosa* (2); *Spiraea ariaefolia*; *Rhus* 3 sp. (3); *Caprifolium Douglasii*, No. 4 (4); *Diplacus* No. 65 (5); *Garrya elliptica*; *Rosa* No. 12 (6); *Lupinus arboreus* and *ornatus*; *Ribes speciosum* and *malvaceum*; *Adenostoma fasciculatum*, a neat little evergreen shrub allied to *Spiraea*; *Arctostaphylos* 3 sp.; a *Vaccinium*; *Gaultheria Shallon*;

(1) *SAMBUCUS GLAUCA* Nutt.

(2) Perhaps *LONICERA INTERRUPTA* 41.

(3) Probably all forms of *RHUS DIVERSILOBA* T. & G.

(4) *SYMPHORICARPOS MOLLIS* Nutt.

(5) *DIPLACUS GLUTINOSUS* (Wendl.) Nutt.

(6) *R. cinnamomea* L. var. *pedunculis solitariis geminibus*.

ROSA PINETORUM Heller, or *R. CALIFORNICA GLANDULOSA* Crepin.

and an evergreen *Prunus*, No. 102 (1), resembling the Portugal Laurel. Of annual and perennials, No. 13; *Hugelia*, No. 5 (2); *Delphinium* 3 sp. No. 24, 26, 61 (3); *Leptosiphon androsaceus* and *densiflorus*; *Collinsia bicolor*; *Convolvulus* No. 23 (4); *Malva* No. 25 (5); *Lupinus succulentus* and *densiflorus*; *Castilleja* No. 39 (6); *Oenothera* No. 3, 44 (7); *Chironia* No. 39 (8). Of bulbs *Calochortus luteus*, *Cyclobothrya alba*, *Brodiaea congesta*, *Calliprora flava*, *Hesperocordum lacteum*, and a *Zygadenus* called *Amole*, of which the bruised roots serve as a substitute for soap.

"On June 22nd I left Monterey for the mission of Santa Cruz, in company with an American gentleman, who obligingly furnished me with a horse for the occasion. Santa Cruz is across the bay, due north, of Monterey, and at a distance of sixty miles by land, whilst by water it does not exceed twenty-five miles. Passing along the sea-shore over the plains, which present the same vegetation as about Monterey, we arrived in the afternoon at the mission, after a gallop of seven hours. This speed is the usual mode of Californian travelling; on longer journeys some horses are driven before, to serve on the following days.

"The mountains of Santa Cruz are well wooded with *Taxodium sempervirens*, called by the American settlers redwood or bastard cedar. In close forests it grows to an enormous size, averaging 200 feet in height, with a stem of 6 to 8 feet in diameter, which is as straight as an arrow, and clear of branches up to 60 or 70 feet. One tree that is termed by the Americans 'the giant of the forest,' is 270 feet high, with a stem measuring 55

- (1) *PHOTINIA ARBUTIFOLIA*.
- (2) *NAVARRETIA ATRACTYLOIDES* H. & A.
- (3) 26. *D. SIMPLEX*. 24. *D. DECORUM*. 61. *D. CALIFORNICUM*.
- (4) *CONVOLVULUS CALIFORNICUS* Chois.
- (5) *SIDALCEA MALVAEFLORA*.
- (6) *C. FOLIOLOSA*.
- (7) No. 3, *GODETIA RUBICUNDA*; No. 44, *G. PURPUREA*.
- (8) *ERYTHRAEA MUHLENBERGII* Griseb.

cure a handful of soil, we are attracted by the gray-green cushions forming the foliage. These are usually from about six inches to a foot across, and about the first week in August we find them covered with small snow white blossoms.



Figure 18. *Phlox dejecta* Nelson and Kennedy

The plant was described as a new species when in all probability Brand's monograph of the Polemoniaceae for the *Pflanzenreich* had gone to press, as it is not mentioned in that work. Broadly considered, it would come under *Phlox caespitosa*, and in the division without internodes and with acerose leaves. Brand treats of two varieties with these characters, *condensata* and *Hendersonii*. That it is not the same as the former we feel fairly certain, as that grew near it on the same mountain, and from the figure of the latter on page 82 of the *Pflanzenreich*, we do not believe that it can be placed with that variety. Whether it is placed as a new species or as a variety of *caespitosa* is of little consequence. What the writer desires to call attention to is that it is the most truly alpine of all the *Phloxes*, and should be in every collection.

AMERICAN FERN JOURNAL

Official Organ of the
AMERICAN FERN SOCIETY

Published quarterly. \$1.00 a year, including membership in the American Fern Society. Single copies 25 cents. No. 1, August, 1910, and No. 2, December, 1910, with membership and subscription for 1911, \$1.40.

Subscriptions should be sent to H. G. RUGG, HANOVER, N. H.

Matter for publication should be addressed to PHILIP DOWELL, PORT RICHMOND, N. Y.

AMERICAN WILD FLOWERS

We publish the only magazine in the world devoted to economic and ecological botany. It is called *The American Botanist*, and is full of interesting things about plants in general and flowers in particular. Just the publication for the rambler, the student and the teacher of botany or nature study. Sample copy free. Sample volume (unbound) 35 cents. Subscriptions 75 cents a year. A set of the 16 volumes already published \$8.00 postpaid. Money refunded if not satisfied. Order to-day.

N. B. We also publish *The Fern Bulletin*, 75 cents a year.

WILLARD N. CLUTE & CO. JOLIET, ILLINOIS.

MUHLENBERGIA

A monthly journal devoted to systematic botany of the higher plants in its broadest sense. Articles on cryptogams (ferns excepted) are not accepted for publication.

The subscription price is \$1.00 a year to all parts of the United States including its foreign possessions, to Cuba, and to Mexico. To all other countries, including Canada, the subscription price is \$1.25 a year. Subscriptions begin with the January number, for full volumes only. Subscribers who wish to discontinue should send in notice promptly at the end of the year. All numbers of a new volume sent to subscribers who fail to give such notice must either be paid for or returned in good condition.

Articles for publication or other communications concerning the journal may be addressed to either of the editors at the University of Nevada, Reno, Nevada.

Subscriptions should be made payable to A. A. Heller, 539 West 5th street, Reno, Nevada.

Volume 1, 1900-1906, consisting of 154 pages, contains 20 titles, with descriptions of many new species and interesting notes about old ones. This volume is of special interest to western botanists. Price \$1.00.

Volume 2, not yet completed. The 340 pages issued deal with the explorations of A. A. Heller in California during 1905, 1906, and 1907. The completed volume will contain about 425 pages. Price \$4.00.

Volumes 3, 4, 5, 6 and 7 (current), issued as a monthly. Price \$1.00 each.

Entered as second-class matter November 24, 1908, at the post office at Reno, Nevada, under the Act of Congress of March 3, 1879.

ANNOUNCEMENT

A new edition of the Catalog of North American Plants is in preparation. Thus far 116 pages have been printed, and other parts will follow as fast as possible. In all there will be about 300 pages. Since a considerable time must elapse before the work can be completed, the 116 pages and other parts as soon as issued, will be sent to those who wish to have them in that form, for \$1.25, payment to be sent with the order.

When completed the Catalog may be had in neat green cloth binding for \$1.50 postpaid. Orders for the cloth bound book may be sent in now, payment to be sent when the book is delivered.

A. A. Heller,
539 West 5th street, Reno, Nevada

RECEIVED
MAY 2 1911

Volume 7

Number 4

MUHLENBERGIA

APRIL, 1911

Editors: A. A. HELLER and P. BEVERIDGE KENNEDY



Castilleja austromontana Standley and Blumer

CONTENTS:

Hartweg's Explorations in California—III: Alice Eastwood	37
A new <i>Castilleja</i> from the southern Rocky Mountains: P. C. Standley and J. C. Blumer	44
<i>Senecio lanatifolius</i> : Georg E. Osterhout	47

University of Nevada,
Reno, Nevada

